

thermo**scientific**

Release Notes and Operating Manual

Thermo 247 Instrument Controller (TDS6)

Software Version

Firmware 6.50 • June 2023

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thermo**scientific**

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Thermo 247 Instrument

1 Using this Document

This chapter provides information about this document, the conventions used throughout the document.

1.1 About this Document

This document describes the functional features and operating principle of your Thermo Fisher device and provides instructions for installation, set up, start up, shut down, operation, maintenance and troubleshooting.

This document also contains safety messages, precautionary statements, and special notices. Follow these properly to prevent personal injury, damage to the device, or loss of data.

Note the following:

- Illustrations in this document are provided for basic understanding. They can vary from the actual model of the device or component. However, this does not influence the descriptions.
- No claims can be derived from the illustrations in this document.
- The Thermo 247 Instrument Controller (TDS6) is referred to as device, equipment, instrument controller or 247IC in this document.

1.2 Conventions

This section describes the conventions that are used throughout this document.

1.2.1 Conventions for Safety Messages

The safety messages and precautionary statements in this document appear as follows:

- Safety messages or precautionary statements that apply to the entire document and all procedures in this document are grouped in the Safety chapter.
- Safety messages or precautionary statements that apply to an entire section or to multiple procedures in a section appear at the beginning of the section to which they apply.
- Safety messages that apply to only a particular section or procedure appear in the section or procedure to which they apply. They appear different from the main flow of text.

Safety messages are often preceded by an alert symbol and/or alert word. The alert word appears in uppercase letters and in bold type. Make sure that you understand and follow all safety messages presented in this document.

1.2.2 Notices

Notices and informational notes in this document appear different from the main flow of text. A note label identifies them. The label text appears in uppercase letters and in bold type.

2 Safety

This chapter provides general and specific safety information and informs about the intended use of the device.

2.1 Safety Symbols and Signal Words

2.1.1 Safety Symbols and Signal Words in this Document

This document contains safety messages to prevent injury of the persons using the device.

The safety symbols and signal words in this document include the following:



Always be aware of the safety information. Do not proceed until you have fully understood the information and consider the consequences of what you are doing.



CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



WARNING

Indicates a hazardous situation that, if not avoided, could result in serious injury.

2.1.2 Observing this document

Observe the following:

- Before installing or operating the device, read this document carefully to be familiar with the device and this document. The document contains important information with regard to user safety as well as use and care of the device.
- Always keep the document near the device for quick reference.
- Save this document and pass it on to any subsequent user.



Read, understand, and comply with all safety messages and precautionary statements presented in this document.

2.1.3 Rating plate

The rating plate is present on the device near the electrical connections. The rating plate indicates the serial number, part number, module name, revision number (if any), and the line rating.

2.2 Intended Use

The device is intended to be used as the controller of chromatography instruments.

The device is for use by qualified personnel and in laboratory environment only.

The device is intended to be used as General Laboratory Equipment (GLE).

It is not intended for use in diagnostic procedures.

This equipment is not suitable for use in locations where children are likely to be present.

Thermo Fisher Scientific recommends that the laboratory in which the device is used follow best practices for chromatography analyses. This includes among others:

- Using appropriate standards
- Regularly running calibration
- Establishing shelf-life limits and following them for all consumables used
- Running the system according to the laboratory's verified and validated 'lab developed test' protocol.

2.3 Safety Precautions

2.3.1 General Safety information

All users must observe the general safety information presented in this section and all specific safety messages and precautionary statements elsewhere in this document during all phases of installation, operation, troubleshooting, maintenance, shutdown, and transport of the device.



If the device is used in a manner not specified by Thermo Fisher Scientific, the protection provided by the device could be impaired. Observe the following:

- Operate the device only within its technical specifications.
- Use only the replacement parts and additional components, options, and peripherals specifically authorized and qualified for the device
- Perform only the procedures that are described in this document and in supporting documents for the device. Follow all instructions step by step.
- Open the enclosure of the device and other components only if specifically instructed to do so in this document.
- Thermo Fisher Scientific cannot be held liable for any damage, material or otherwise, resulting from inappropriate or improper use of the device. If there is any question regarding appropriate usage, contact Thermo Fisher Scientific before proceeding.

Safety Standard

The device has been manufactured and tested according to international safety standards.

2.3.2 Qualification of the Personnel

Observe the information below on the proper qualification of the personnel installing and/or operating the device.



Installation

Only skilled personnel are permitted to install the device and to establish the electrical connections according to the appropriate regulations.

- Thermo Fisher Scientific recommends always having service personnel certified by Thermo Fisher Scientific perform the installation (for brevity, referred to as Thermo Fisher Scientific service engineer).
- If a person other than a Thermo Fisher Scientific service engineer installs and sets up the module, the installer is responsible for ensuring the safety of the module and system.



General Operation

The device is designed to be operated only by trained and qualified personnel in a laboratory environment.

2.3.3 Electrical Safety Precautions



WARNING – Electric Shock or Damage to the Device

- Do not make any changes to the electrical or grounding connections.
- If you suspect any kind of electrical damage, disconnect the power cord and contact Thermo Fisher Scientific Technical Support for assistance.
- Do not open the housing or remove protective panels unless specifically instructed to do so in this document.
- Do not place liquid reservoirs directly upon the device. Liquid might leak into the device and get into contact with electronic components causing a short circuit.

2.3.4 General Residual Hazards

Pay attention to the following general residual hazards when working with the device:



WARNING – Flammability

- Do not operate the device in a potentially flammable environment.
- Do not operate the device in the presence of flammable gases or fumes.

2.3.5 In case of Emergency



WARNING – Safety Hazard

- In case of emergency, disconnect the device from the power line.

2.4 Compliance Information

Thermo Fisher Scientific performs complete testing and evaluation of its products to ensure full compliance with applicable domestic and international regulations.

Changes that you make to the device may void compliance with one or more of these standards. Changes to the device include replacing a part or adding components, options, or peripherals not specifically authorized and qualified for the product by Thermo Fisher Scientific. To ensure continued compliance, replacement parts and additional components, options, and peripherals must be ordered from Thermo Fisher Scientific or one of its authorized representatives.

The device has been shipped from the manufacturing site in a safe condition.

2.4.1 Declaration of Conformity

CE Declaration of Conformity:

The device has satisfied the requirements for the CE mark and is compliant with the applicable requirements.

RoHS Compliance



This product complies with the RoHS (Restrictions of Hazardous Substances) directives:

- European RoHS Directive
Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The CE mark on the device indicates that the product is compliant with the directive.

- China RoHS regulations
Measures for Administration of the Pollution Control of Electronic Information Products

One of the following logos may be present on the device if applicable:

Logo	Description
	The green logo marks items that do not contain the hazardous substances identified by the regulations.
	The logo including a one-digit or two-digit number marks items that contain hazardous substances identified by the regulations. The number indicates the environment-friendly use period (EFUP) of the item. During this period, the item (when used as intended) will not cause serious damage to human health or environment. For more information, go to http://www.thermofisher.com/us/en/home/technical-resources/rohs-certificates.html

UKCA Declaration of Conformity

The device has satisfied the requirements for the UKCA mark and is compliant with the applicable requirements.

UL/CSA Compliance

The label of the NRTL Lab on the device (for example, cTUVus, cMETus or CSA mark) indicates that the device has satisfied the requirements of the applicable standards.

2.4.2 WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive. It is marked with the following symbol:



WEEE Symbol

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. For further information, contact Thermo Fisher Scientific.

2.4.3 FCC Compliance

This equipment has been tested and found to comply with the limits for Class A digital device pursuant to part 15 of the U.S. FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his expense.

3 Device Overview

This chapter introduces you to the device.

3.1 Introducing the Thermo 247 Instrument Controller (TDS6)

The Thermo 247 Instrument Controller (TDS6) (247IC) is a dedicated network device which acts as the connection point between your chromatography instruments and your Enterprise Thermo Scientific Chromatography Data System (CDS).

Using an optimized version of the Microsoft Windows™ operating system and running the Instrument Control software components of Thermo Scientific™ Dionex™ Chromeleon™ CDS or Thermo Scientific Atlas™ CDS, the 247IC manages all communication between your instruments, and your CDS, including status updates, instrument method download, workbook queues, and buffering and transfer of acquired chromatography data. Deploying your CDS instrument control on a 247IC ensures you have a standardized hardware and software platform for every instrument controller in your system, and can reduce the time, effort and cost involved in the installation, configuration, and validation of your system.

The Thermo 247 Instrument Controller (TDS6) is the latest version of this device and is designed to be ultra-secure, highly-reliable, and low-maintenance, to keep your instruments operable 24 hours a day, 7 days a week.



Figure 1: Thermo 247 Instrument Controller (TDS6)

3.2 Introducing the TDS 6.50 Firmware

The Thermo 247 Instrument Controller (TDS6) is a dedicated network acquisition device designed exclusively for Thermo Scientific CDS software. It uses an optimized version of Windows as its operating system, referred to as the 247IC “firmware”. This firmware has been designed and built by Thermo Fisher Scientific specifically for the 247IC, for use with Thermo Scientific Chromatography Data System software. By using a standardized firmware, the 247IC ensures consistent implementation of your CDS software, and provides you with the assurance that the hardware, firmware and software controlling your instruments have all been rigorously tested in combination by Thermo Fisher Scientific.

This document announces the release of the latest version of Firmware for the 247 Instrument Controller. This new firmware, version number TDS6.xx, is built on the Microsoft Windows 10 LTSC platform and takes advantage of several new features in Windows 10 to form the most secure and most reliable version of 247IC firmware yet available.

Every aspect of the 247IC hardware and firmware has been designed with security in mind. The 247IC uses a layered approach to security, making use of a range of different security features to provide a comprehensive overall security package and ensuring that the 247IC is considerably better protected against all the recognized types of malware than a standard Windows PC. Please see document “CM7ID_330--Windows 10 247IC security model.doc” in the Chromeleon Enterprise documents for a more detailed description of the security features of the 247IC.

3.3 Supported Chromatography Data Systems

247IC firmware version TDS6.50 is supported on the following Thermo Scientific Chromatography Data Systems:

- Chromeleon 7.3 (and subsequent point releases of 7.3)
- Chromeleon 7.2.10 (and subsequent MU releases of 7.2.10)
- Chromeleon 7.2 SR5 MUj (and subsequent MU releases of 7.2 SR5)
- Atlas 8.3 SR5 (and subsequent SR releases of Atlas 8.3)^[1]

[1] Please see the Known Limitations section below for information regarding an issue which could affect Atlas 8.3 SR5 running on Windows 10.

In order to prepare the TDS 6 for the installation of Atlas, it is necessary to run the AtlasConfig.bat file as an administrator as shown:

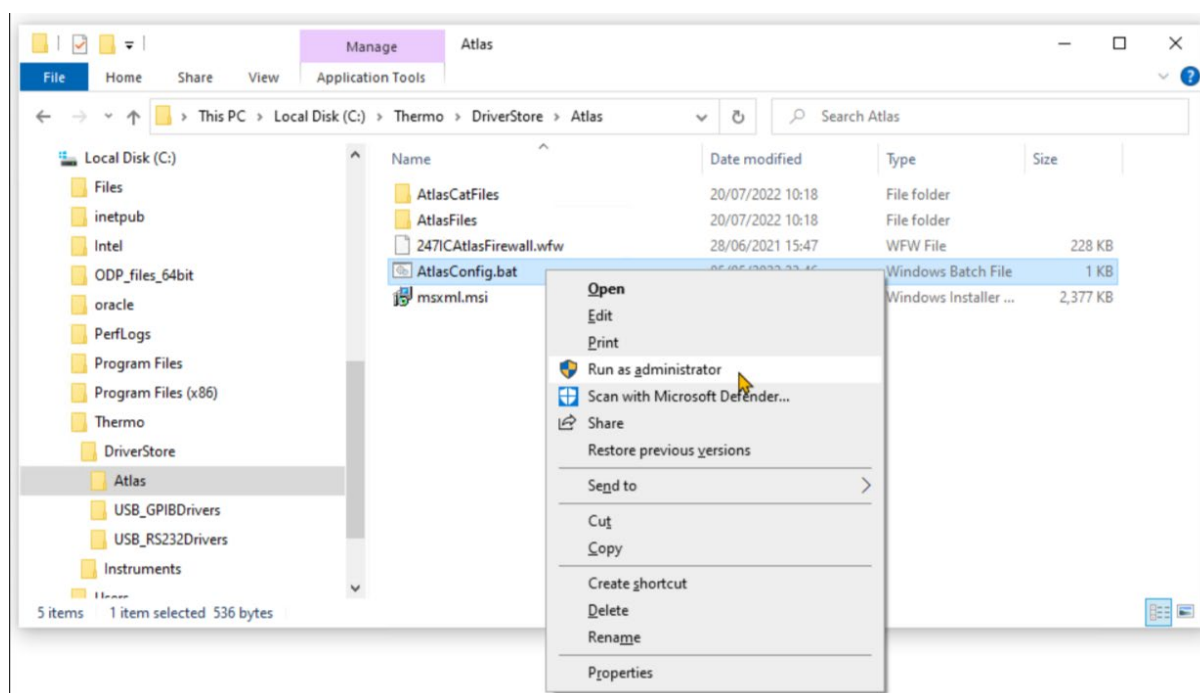


Figure 2: Preparing the TDS6 for Atlas Installation.

1. Open Windows Explorer and browse to the folder C:\Thermo\DriverStore\Atlas
2. Right-click on AtlasConfig.bat and choose “Run as Administrator”
3. Acknowledge any prompts that appear.
4. On completion, follow the usual Atlas installation procedure.

3.4 Supported Instruments

The 247IC supports connection to all Chromatography instruments with 2D and 3D detectors listed in the List Of Supported Instruments (LOSI) for each of the versions of the Chromatography Data Systems listed above. Each LOSI specifically identifies the 247IC versions supported for each instrument type.

At the time of the release of 247IC firmware TDS6.50, Mass Spectrometry devices are not supported for use on the 247IC.

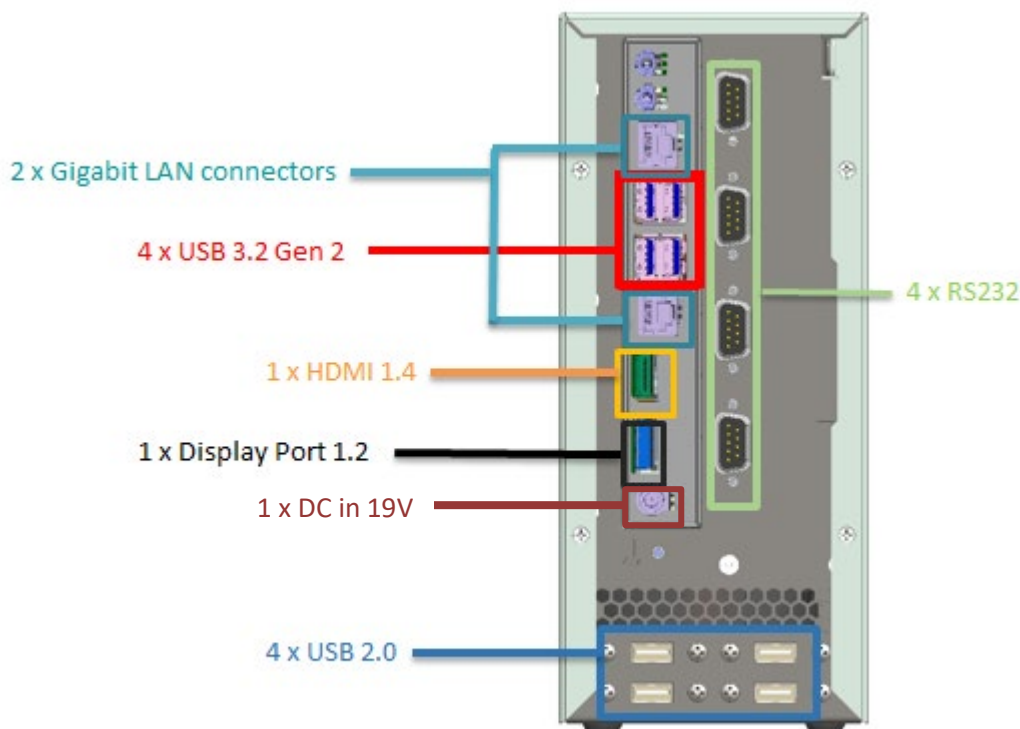


Figure 2: Rear View of Thermo 247 Instrument Controller (TDS6)

To enable connection of Chromatography instruments, the 247IC provides the following connection ports located on the back of the unit:

- 4 x USB 3.2 Gen 2
- 4 x USB 2.0
- 2 x Gigabit LAN connectors
- 1 x HDMI 1.4
- 1 x Display Port 1.2
- 4 x RS232 (1 supports 232/422/485)
- 1 x DC in 19V

Please see the Known Limitations section below for information regarding USB-to-GPIB connection.

3.5 Support for non-Thermo Scientific Instrument Control in Chromeleon

Some Chromeleon instrument control is provided via non-Thermo Scientific software. For full details of support for this 3rd party control refer to the LOSI applicable to the Chromeleon version you are using.

The security model used on the 247IC requires that all 3rd party software is approved by Thermo Fisher Scientific, and a signed security catalog (.cat) file is installed onto the 247IC before the 3rd party software is installed. Refer to document "CM7ID_330--Windows 10 247IC security model.doc" in the Chromeleon Enterprise documents for a description of the process for obtaining and installing a .cat file.

Details of the three major 3rd party control packages used in Chromeleon are described below:

- **Agilent Instrument Control Framework (ICF)**

Thermo Fisher Scientific recommends the use of the “Agilent Drivers for Chromeleon” supplied as an option in the Chromeleon installation kit to connect to Agilent HPLC instruments (and some Agilent GC instruments from Chromeleon 7.3 onwards). For modules not supported with this driver, the Agilent Instrument Control Framework (ICF) can be used. In order to meet the security requirements of the 247IC running TDS6.50 firmware, the Agilent ICF version A02.06 Update 2 (or later) must be used.

- **Waters Acquity Instrument Component Software (ICS)**

The *minimum* version of Waters Instrument Control Software supported for use on 247IC running TDS6.50 firmware is Waters Driver Pack 2019 R1. This is supported for use with Chromeleon 7.2 SR5, Chromeleon 7.2.10 and Chromeleon 7.3.x. The .cat file required to install this version of ICF is available from Thermo Fisher Scientific.

Note: For Chromeleon versions starting with Chromeleon 7.3.2, a driver and support layer will be available from Waters, customers should contact Waters to obtain this. There will be a cat file available from Waters.

- **Shimadzu**

Shimadzu LC and GC instruments can be controlled in Chromeleon using the Shimadzu LC driver for Chromeleon and the Shimadzu GC driver for Chromeleon. These are installed using an installation kit that is not part of the Chromeleon DVD. To install these drivers on a 247IC you must obtain from Thermo Fisher Scientific a .cat file appropriate to the version of driver you are installing.

3.6 Support for non-Thermo Scientific software in Chromeleon

Apart from the instrument control described in the previous section, the other most common piece of 3rd party software which might need to be installed on a 247IC is the Oracle client. This is used by Chromeleon when connecting to a Chromeleon DataVault which is using an Oracle database.

In order to install the Oracle client, you need to obtain from Thermo Fisher Scientific a .cat file for the specific version of Oracle client you wish to install.

Please see document “CM7ID_330--Windows 10 247IC security model.doc” in the Chromeleon Enterprise documents for a more detailed description of the process of installing a .cat file.

3.7 Support for non-Thermo Scientific Instrument Control in Atlas

- **Waters Acquity Instrument Component Software (ICS)**

The only version of Waters Driver Pack supported for use with Atlas is Waters Driver Pack 2, but this is not supported by Waters for use on Windows 10, and therefore is not supported for use with the TDS6.50 firmware.

It is technically possible to install Waters Driver Pack 2 onto a 247IC running TDS6.50 firmware, and the necessary .cat file is pre-installed on the 247IC. However, this is *not supported* either by Waters or by Thermo Fisher Scientific.

Caution should be taken when using this un-supported version of Waters Driver Pack with Atlas on a 247IC running TDS6.50 firmware.

3.8 Resolved Issues

This chapter describes all issues that have been resolved with the release of TDS 6.50 Firmware. If an issue is not listed here, it has not been resolved with this software update.

The numbers in the first column of the table below refer to the Thermo Fisher Scientific tracking IDs.

ID	Description
331143	Native Image Performance Issues on 247IC: If Austria, Germany, or Switzerland was selected as the region at initial setup, the 247IC would be slow to start up, the issue being worse, the more instrument drivers that were configured.
123716	USB-to-GPIB connector for Chromeleon: It was not possible to use a Keysight USB-to-GPIB connector with the 247IC.
47121	Agilent ICF for Chromeleon: The Agilent ICF driver shipped with Chromeleon 7.3 (version A02.05) cannot be installed onto a 247IC. This is resolved by installing the more recent ICF A.02.06 Update 2 or preferably by using Agilent Drivers for Chromeleon (ADC).

3.9 Known Limitations

This chapter describes all issues that are known with the TDS 6.50 Firmware.

The numbers in the first column of the table below refer to the Thermo Fisher Scientific tracking IDs

ID	Description
SCR123448	<p>Atlas Temp folder: Windows 10 introduced a new feature called Storage Sense. This is designed to free up space on your hard drive by deleting files and folders in the Windows Temp folder. In all versions of Atlas before Atlas 8.3 SR6 the Temp folder is used as a temporary cache folder for files used by the DataServer software running on the 247IC. Storage Sense is turned OFF by default on the TDS5.50 firmware but, if the C: drive gets within ~100MB of full capacity, Windows 10 will turn this feature on. The C: drive on a TDS5 model of 247IC is 100GB, and the cached files are relatively small (approx. 5KB/min for 2D data). So the likelihood of the C: drive becoming so full that Windows turns Storage Sense on is very low. If your 247IC becomes disconnected from the network for a long period of time, with queued workbooks which continue to acquire, you should check the Storage Sense setting after the network is restored to ensure that it is still set to OFF.</p> <p>This issue does not occur in Atlas 8.3 SR6, as the temporary cache folder was moved to \Thermo\DS\Cache to remove the potential risk described above. Additionally, the extra on-board memory in the TDS 6 makes this issue very unlikely in Atlas 8.3 SR5.</p>

4 Installation

Chromeleon 7.2.10 introduced the ability to deploy software updates to remote 247IC from within the Chromeleon Admin Console. This functionality was further enhanced for Chromeleon 7.3. The process for initially installing, and subsequently updating, CDS software on the 247IC therefore depends on which version of CDS you are using.

The following section provides instructions for installation, start up and describes the first-time-boot process for new (or re-imaged) 247ICs, and then describes the process for initial installation of Chromeleon or Atlas software.

4.1 Installing the Instrument Controller

4.1.1 Safety Guidelines for Installation

Pay attention to the following safety guidelines:



CAUTION – Safety Precautions

- Observe all warning messages and precautionary statements presented in 2.3 Safety Precautions



CAUTION – Electric Shock or Damage to the Device

- Connecting the device to a line voltage higher or lower than specified could result in personal injury or damage to the device.
- Connect the device to the specified line voltage only.

The power cords are designed to match the wall socket requirements of the country in which they are used. The end of the power cords that plugs into the power socket on the device is identical for all power cords. The end of the power cords that plugs into the wall socket is different.



WARNING – Electric Shock or Damage to the Device

- Never use a power cord other than the power cords provided by Thermo Fisher Scientific for the device.
- Only use a power cord that is designed for the country in which you use the device.
- Do not use extension cords.
- Never plug the power cord to a power socket that is shared with other equipment (for example, multiple sockets).
- Operate the device only from a power outlet that has a protective ground connection.
- In case of emergency, it must be possible to reach the power cord easily at any time to disconnect the device from the power line.

**WARNING – Electric Shock or Damage to the Device**

- Misuse of the power cords could cause personal injury or damage the instrument. Use the power cords provided by Thermo Fisher Scientific only for the purpose for which they are intended. Do not use them for any other purpose, for example, for connecting other instruments.

4.1.2 Installation Instructions

If personnel other than a Thermo Fisher Scientific service engineer installs the device, follow the steps below.

1. Carefully unpack the Instrument Controller and remove all packaging materials.
2. Verify that the Instrument Controller is undamaged.
3. Place the Instrument Controller on a sturdy and stable surface near an electrical outlet.

NOTICE – Condensation

Condensation in a device can damage the electronics.

- Before connecting the devices to the power line, be sure that no condensation is present in the devices.
 - If you suspect that condensation is present, allow the device to warm up to room temperature slowly. Wait until the condensation is completely gone before proceeding.
4. Connect the power adapter to the designated power input port on the device.
 5. Connect the free end of the power cord to an appropriate power source.
 6. Connect your peripherals to the designated input following the instructions of the manufacturer of the peripheral.
 7. Integrate the Instrument Controller into the instrument LAN

NOTICE – Connectors

- Refer to section 3 for the connection ports located on the back of the unit.
 - Connection ports are labelled on the back of the unit as well.
 - Never use defective cables. If you suspect that a cable is defective, replace the cable.
 - To ensure trouble-free operation, use only the cables provided by Thermo Fisher Scientific for connecting the device.
8. Double-check that all connections are secure and properly inserted.
 9. Locate the power on/off button on the device upper front.
 10. Press and hold the power button for a few seconds until booting up starts.
 11. Allow the operating system to load fully.

4.2 Windows 10 first-time-boot

NOTE: The 247IC is supplied in a 'pre-first-time-boot' state. The first time it is turned on, Windows 10 will immediately start its first-time-boot process (also known as OOBE), during which you will be asked to provide Windows with several pieces of information such as Computer Name, Administrator account name and password, etc.

This first-time-boot process *must be allowed to run to completion* following initial power-up of the 247IC. Failure to complete the first-time-boot process will result in an incomplete Windows installation and the 247IC will need to be restored to the factory state before repeating the first-time-boot (see section 9 for further information about performing a Factory Reset on the 247IC).

It is therefore essential that the 247IC has a keyboard, monitor and mouse connected *before* connecting the power cable and *before* switching on the 247IC.

4.3 Prerequisites

Prior to installation, make sure you have the following:

- Keyboard, monitor and mouse (not supplied)
- Computer name ready to apply to the 247IC (according to local IT policies)
- Local Administrator account name and password ready to apply to the 247IC (according to local IT policies)

4.4 Windows first-time boot process

4.4.1 Performing first-time-boot

1. Connect the power transformer to an electrical outlet using the power cable supplied with the 247IC, or using a C13 type power cable (standard cable for connecting any PC to an electrical outlet).
2. Turn on the 247IC using the large power button on the front of the unit. (**See note above** – this will immediately start the Windows first-time-boot process, which **must be run to completion** at this point.
3. During the Windows first-time-boot process you will be prompted for several pieces of information. Use the following steps to determine how to complete these requests.
 - i. **Welcome**
Click the Next button.
 - ii. **Choose a name for this this 247 Instrument Controller**
The default is DSXXXXXX where XXXXXX should be replaced with the serial number of the 247IC. For example, DS123456. The serial number can be found on the back of the 247IC. Alternatively, you can use a name which fits with your organization's naming convention.

Note: Once Chromeleon has been installed, the name of the 247IC should not be changed, so be careful to choose a suitable name at this stage.

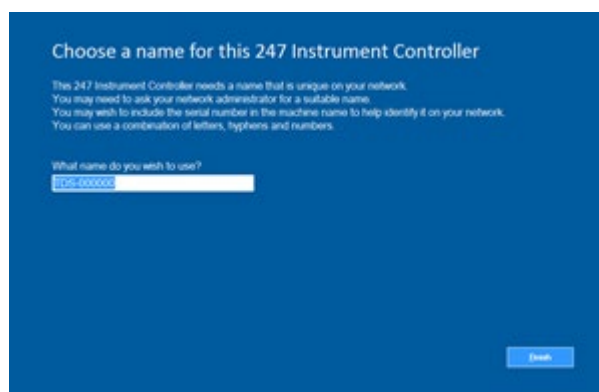


Figure 2: Choose a name for this 247 Instrument Controller screen

- i. **Click the Finish button**
The 247IC will reboot at this time. Allow the reboot to proceed. Setup will continue after the reboot.
- ii. **Let's start with region. Is this right?**
Select the appropriate region and click the Yes button.
- iii. **Is this the right keyboard layout?**
Select the appropriate choice and click the Yes button.
- iii. **Want to add a second keyboard?**
Click the Skip button.

The 247IC will automatically reboot at this time. First-time-boot setup will continue after the restart.

- iv. **Who is going to use this PC?**
Enter in the name of the account that will be the administrator of this 247IC. For example: TDSAdmin.

Click the Next button.
- v. **Create a super memorable password**
Enter a password for the administrator account.

Note: Password must be 14 characters with uppercase, lower case and a number
- vi. **Confirm your password**
Re-enter the password created in the previous step

Click the Next button
- vii. **Add Password Hint**
Provide a suitable password hint without providing the actual set password
- viii. **Which Chromatography Data System**

You are now presented with the option to immediately configure your 247IC for connection to a Chromeleon or Atlas system, or to install your CDS later.

- To automatically connect and configure your 247IC with a Chromeleon Domain Controller running Chromeleon 7.2.10 (or later) or Chromeleon 7.3 (or later) choose the Chromeleon option.
- To connect your 247IC to a Chromeleon Domain Controller running Chromeleon 7.2 SR5 Muk (or later) choose the “I will install it manually later” option.
- To connect your 247IC to an Atlas 8.3 system, choose the Atlas option.

Choosing either the “I will install it manually later” or Atlas options at this point presents you with the default Windows 10 desktop and background image which, after a few seconds, will be replaced with the Thermo Fisher Scientific desktop like the one shown here:



Figure 3: 247IC desktop following completion of Windows first-time-boot process

Once you see this desktop, the Windows first-time-boot process has completed, and it is safe to turn off the 247IC. Unless you have used the automated Chromeleon installation (see next section) you will still need to complete manual installation of Chromeleon, or you will need to perform an Atlas Depot Update.

4.5 Initial installation of Thermo Scientific CDS software

This section describes the methods for installing Thermo Scientific CDS (Chromeleon or Atlas) software onto your 247IC running TDS6.50 firmware.

4.5.1 Automated Chromeleon installation

Applicable to Chromeleon 7.2.10 (or later) and Chromeleon 7.3 (or later) systems

The simplest way to configure your 247IC for a Chromeleon 7.2.10 or Chromeleon 7.3 system is to use the automated installation process.

Notes:

- If in section xiii above, you chose the “I will install it manually later” option, you can return to the automated process using the “247 Initialization” desktop icon.
- The automated installation process requires at least one Chromeleon Installation Package to be available on the Chromeleon Domain Controller before you start this process. Chromeleon Installation Packages are created via the Chromeleon Admin Console (see Chromeleon Admin Console documentation for information about creating and distributing Installation Packages).

i. Enter Chromeleon Domain details

After choosing the Chromeleon (automated) option, you will be presented with the Enter Chromeleon details screen:

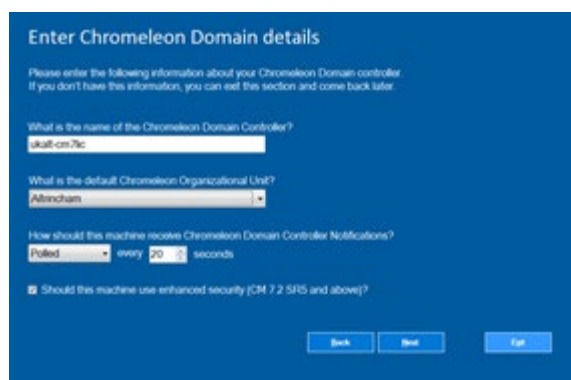


Figure 4: Enter Chromeleon Domain Details screen

Enter the name of the Chromeleon Domain controller you wish to connect to.

If the CM DC has Org Units configured, select the Org Unit you want this 247IC to belong to.

Choose whether to use Push or Polled Notifications.

Ensure the Enhanced Security checkbox is ticked.

ii. Select Chromeleon components to install

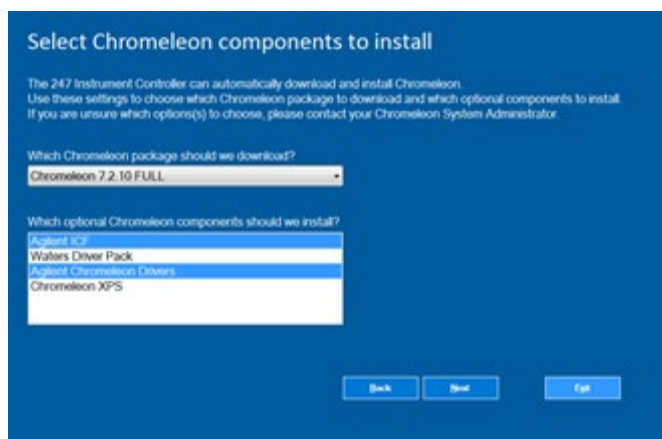


Figure 5: Select Chromeleon components to install screen

The 247IC will now connect to the selected Chromeleon Domain Controller and will present you with a list of available Chromeleon Installation Packages.

Select the appropriate Installation Package and select any available optional components to include in the installation process.

Click the Next button.

iii. Thank you, we have everything we need

The “Thank you...” screen shows a summary of the options chosen in the previous screens.

Click the Finish button to start the download and installation process.

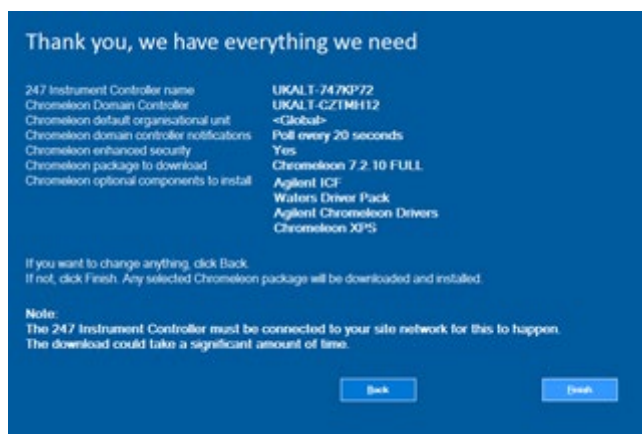


Figure 6: Thank you screen

iv. Downloading Chromeleon...

The 247IC will now begin the automated download and installation of Chromeleon.

Depending on your network speed and the download options selected in Chromeleon Admin Console, this process can take a long time.

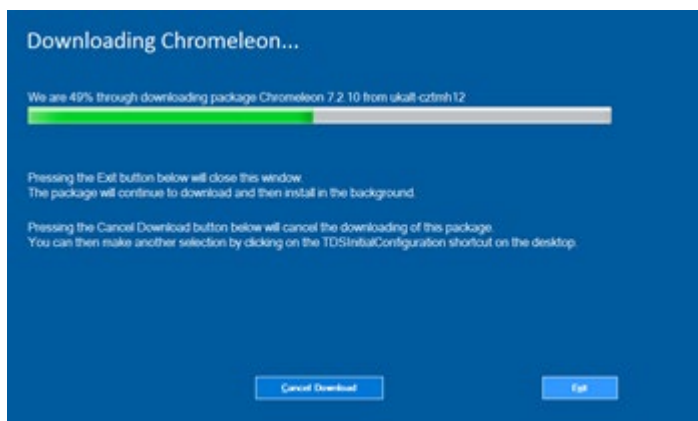


Figure 7: Downloading Chromeleon screen

i. Getting things ready

Once the 247IC has downloaded the installation package, it will automatically install Chromeleon. During this time the “Getting things ready” screen will be displayed:

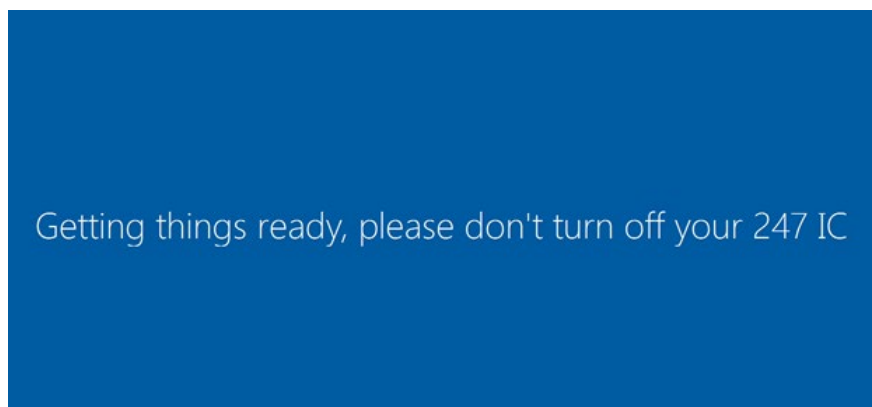


Figure 8: Getting things ready screen

ii. Reboot

After Chromeleon has installed, the 247IC will reboot and this completes the automated installation process.

To run the IQ kit on a Chromeleon 7.2.10 system, log into the 247IC using the Administrator account previously set up and choose the Station IQ option from the *Start > Thermo Chromeleon 7* menu. The IQ report will be displayed on the 247IC upon completion.

To run the IQ kit on a Chromeleon 7.3 system, run the Chromeleon Admin Console from any Chromeleon client station, locate the 247IC in the *Domain Resources > Computers* list, and choose the *Installation and Maintenance > Installation Qualification > Run IQ kit* menu option. The IQ report can be displayed using the *Installation and Maintenance > Installation Qualification > View IQ report* menu option.

4.5.2 Manual Chromeleon installation

Should a maintenance update be required to be installed in addition to the core version, the core version must be present first. As maintenance updates are cumulative updates, only the most recent update needs to be installed. This will include all previous updates back to the core version.

The security features of the 2471C include several measures to ensure that software cannot be accidentally or maliciously installed. In order to install Chromeleon *manually* (rather than using the *automated* method described above) you must log in with local Administrator privileges and have access to the Chromeleon installation kit via a network share or by use of a removable USB drive. To use a removable USB drive, you must temporarily disable some of the 2471C's security settings. To maintain the high level of security on the 2471C, you must re-enable any modified settings following installation of Chromeleon.

i. Enable Removable Media (Local Group Policy)

Only required for installation from a removable USB drive

- Run GPEDIT.MSC (Local Group Policy Editor) from the *Windows > Start* button.
- Select Computer Configuration / Administrative Templates / System / Removable Storage Access.
- Set All Removable Storage classes: **Deny all access to Not Configured.**
- Select User Configuration / Administrative Templates / System / Removable Storage Access.
- Set All Removable Storage classes: **Deny all access to Not Configured.**
- Select Computer Configuration / Administrative Templates / Windows Components / BitLocker Drive Encryption / Removable Data Drives.
- Set Deny write access to removable drive not protected by BitLocker to **Not Configured.**
- Place the removable USB drive containing the Chromeleon media into one of the USB ports on the 2471C.

ii. Mount Chromeleon Installation Media

- Using the Windows File Explorer, locate the Chromeleon ISO file from a network share location or from a removable USB drive. Double click to mount the ISO file.

iii. Update Catalogue Files

A key feature of the Security Model of the 2471C is the use of WDAC to block any application which has not been authorized to run on the 2471C. In order to manually install Chromeleon, an updated Catalog file must be used to authorize the 2471C to run the Chromeleon installation kit.

Each Chromeleon installation kit has a specific Catalog file which can only be used for that installation kit. During automated installation, this Catalog file is automatically copied to the required location on the 2471C. For manual installation, this must be copied manually.

The catalogue file can be found in the Tools\Updater\Installer folder of the mounted Chromeleon installation media.

- Copy this file (e.g. Chromeleon.7.2.10.23925.cat) to
C:\Windows\System32\CatRoot\{F750E6C3-38EE-11D1-85E5-00C04FC295EE}

iv. Run the Chromeleon Installation Media

- With the Catalog file installed, the Chromeleon installation media can now be run as normal.
- Following installation, the IQ Report will automatically run. As the IQ results are created as an .html file, and 247IC does not have a browser installed, the IQ will need to be viewed on another computer. In Chromeleon 7.3 (and later), the Chromeleon Administration Console has the ability to access and view IQ results from a 247IC remotely.

v. Reset security settings

Run GPEDIT.MSC as in section (i) and change all options from **Not Configured** back to **Deny all access**.

vi. Completion

Installation of your 247IC is now complete. The 247IC can now be deployed to your laboratory.

4.5.3 Atlas installation

Applicable to Atlas 8.3 SR5 (or later) systems

Note: An issue has been observed on a PC running a desktop version of Windows 10 (i.e. not the LTSC version of Windows 10 used for TDS6.50 firmware). Windows 10 has a new feature called Storage Sense which automatically 'cleans-up' the Windows Temp folder. Up-to-and-including Atlas 8.3 SR5, the Windows Temp folder is used for storing Instrument Queues and for temporarily storing acquiring data before transferring to the Atlas Server. Consequently, there is the potential that instrument acquisition could be interrupted or acquired data would be deleted if Storage Sense was ON. The Storage Sense feature is turned OFF by default in the TDS5.50 firmware, and *no problems have been observed* on any 247 using TDS6.50 firmware. However, if the C: drive on the 247IC gets within 100Mb of full, Windows will automatically turn ON Storage Sense, which could potentially cause the contents of the Temp folder to be automatically deleted. This should not occur in 'normal' operation.

Atlas 8.3 SR6 resolves this issue by relocating the folder that Atlas previously used Windows Temp folder for, however if you are using an earlier SR of Atlas 8.3, then you need to be aware of the possibility of this issue occurring.

See SCR123448 in the Known Limitations above for details.

The process for installing Atlas onto a 247IC running TDS6.50 firmware is no difference from previous WES7 and Xpe firmware. The TDS6.50 firmware has all catalog files required for installing Atlas 8.3 – Atlas 8.3 SR5 and all instrument extensions released up-to-and-including Atlas 8.3 SR5. Atlas 8.3 SR6 automatically installs its own catalog file.

- i. Log into the 247IC using the Local Admin account setup during the Windows first-time-boot process.
- ii. Add the 247IC to the Windows Domain.
- iii. Add a Windows Domain account to the local administrators group on the 247IC.
- iv. Configure the DSController service to use this Domain account.
- v. Start the DSController service running.
- vi. Run Atlas Instrument Manager and create a new instrument. Select this 247IC as the DataServer for this instrument.
- vii. Run Windows Explorer on the 247IC and select the *C:\Thermo\DS* folder.
- viii. Confirm that a Config.xml file has been created.
- ix. Restart the DSController service – this will initiate the automatic Depot Update on the 247IC.

- x. Once the update has completed, the 247IC will automatically reboot. If the 247IC does not automatically reboot at this point, check the Windows Event Viewer for any errors relating to the update.
- xi. Following reboot, the 247IC is ready for use as part of your Atlas system.

5 Maintenance

This chapter describes the routine maintenance procedures that the user may perform.



WARNING – Maintenance procedures

- Additional maintenance or service procedures must be performed only by service personnel certified by Thermo Fisher Scientific

5.1 General Rules for Maintenance and Service

- Before starting maintenance or service procedures, turn off the Instrument Controller.
- Use only the replacement parts specifically authorized and qualified for the device by Thermo Fisher Scientific.

5.2 Replacing the Instrument Controller

Contact Thermo Fisher Scientific to replace the Instrument Controller.

5.3 Performing a Factory Reset

The following section describes the steps to perform a Factory Reset. A Factory Reset will return the 247IC to its 'clean' state. A Factory Reset is not required under normal circumstances, but can be used to reset the device following a software issue, or when moving from Atlas to Chromeleon. A factory reset would also need to be performed if the Windows first-time boot Out-Of-the-Box-Experience (OOBE) fails to complete for any reason. The most common situation where this can occur is if the 247IC is turned off during the OOBE process (see figure 10).

Once the Factory Reset has been performed, the 247IC will automatically power-down and will have been returned to its factory condition. Do not allow the 247IC to restart again until you are ready to perform the OOBE steps (see section 9).

5.3.1 Indication that a Factory Reset is required

The following message is normally only seen if the 247IC has entered but not completed the first-time boot process. If you see this message, then a Factory Reset must be performed before any other tasks can be undertaken on the 247IC.

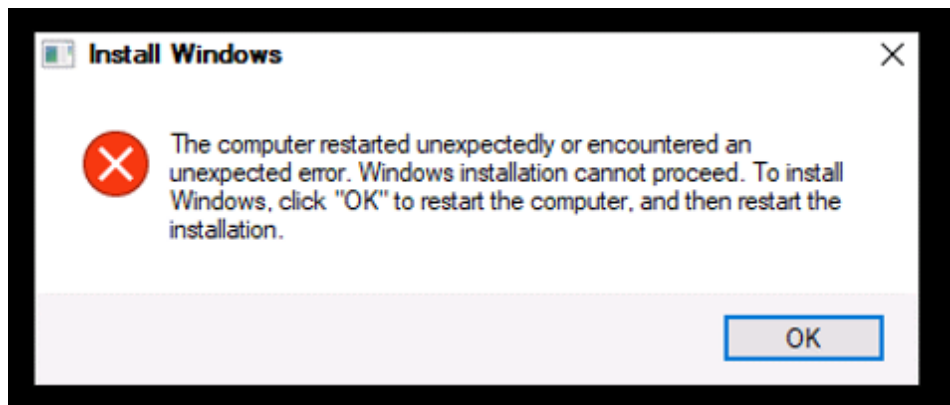


Figure 9: 247 Install Windows error - shows that the first-time boot process started, but didn't complete

5.3.2 Preparation for performing a Factory Reset

1. Place 247IC on a level surface.
2. Connect an HDMI Monitor using DVI or Display Port connector on rear of IC (highlighted green in figure 2)
3. Connect monitor power cord (not supplied) to wall socket.
4. Connect USB mouse and USB keyboard to 2x lower USB 2.0 ports on rear of IC (highlighted black)
5. Connect power transformer to 19V DC connector on rear of 247IC (highlighted red) * *Do not connect to wall socket yet* *

5.3.3 Process for performing a Factory Reset

This section describes the steps to perform the Factory Reset on a 247IC.

1. Confirm that all preparation steps have been completed.
2. Ensure the monitor power cable is connected, then turn on the monitor.
3. Ensure the 247IC power cable is connected between the transformer and the wall socket.
4. Turn on the 247IC by pressing the power button on the front of the 247.
5. Windows should go into Recovery mode and display the following screen:

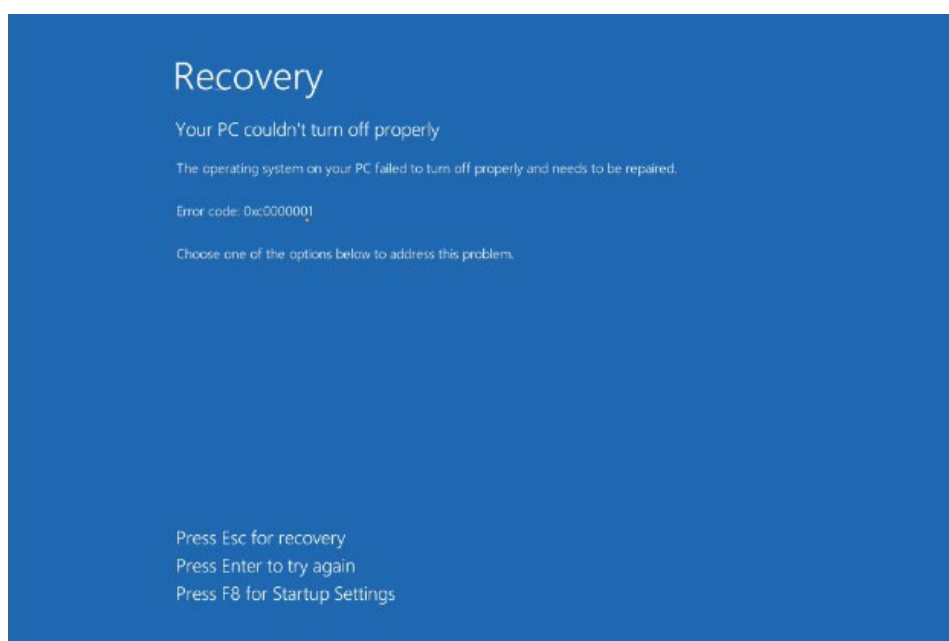


Figure 10: Windows Recovery screen on 247IC

6. If the 247IC does not show this screen, perform a 'hard' reboot by holding in the power button for a couple of seconds to turn off, and press the power button to turn back on. (Windows goes into Recovery mode if 3 hard reboots are performed within 2 minutes).
7. Press the <Esc> key to display recovery options.
8. The 247IC will load the recovery files:



Figure 11: 247IC loading recovery files

9. After reboot, the 247IC will load the following screen:

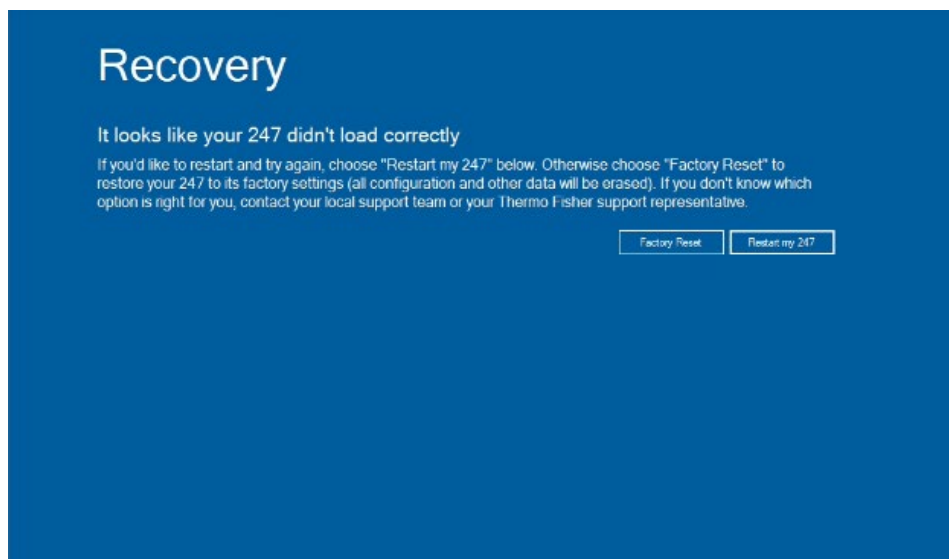


Figure 12: 247IC recovery options

10. Click the Factory Reset button, then click Yes to confirm Factory Reset.

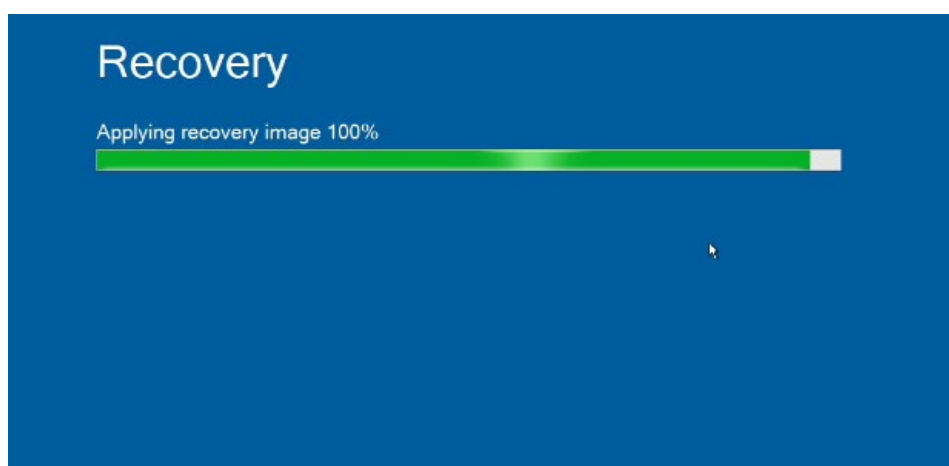


Figure 13: 247IC applying Factory Reset recovery image

11. Once the Factory Reset has been applied, the 247IC will automatically switch off. It is now ready to restart the installation process, as described in section 8. Do not turn the 247IC back on at this point unless you are ready to start and complete the first-time boot (OOBE) process.

6 Device Specifications and Operating Limits

Processor	2.3 GHz 6 core processor
RAM	16 GB
Storage	1 x 500 GB solid state drive (operating system and data buffering)
Connectors	4 x USB 3.2 Gen 2 4 x USB 2.0 2 x Gigabit LAN connectors 1 x HDMI 1.4 1 x Display Port 1.2 4 x RS232 (1 supports 232/422/485)
Software	Optimized Microsoft Windows 10 IoT 21H2
Dimensions	100mm width 230mm height 220mm depth
Power Supply	100 to 240V, 120W
Operating Temperature	0 to +40 °C
Storage Temperature	-20 to +70 °C
Humidity	10 to 90 %

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